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AUTHOR Curtis, P. A.; And Others
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ABSTRACT

A computer literacy assessment instrument was developed to evaluate the current level of computer literacy of students enrolled in agricultural classes at Texas A&M University. A faculty member from each of the 19 departments in the College of Agriculture was asked to recommend two classes representative of the students in his or her department, and the survey was administered to this sample of 895 students. Results were analyzed by analysis of variance techniques to determine if there was a significant difference in literacy scores between students in the freshman, sophomore, junior, senior, or graduate classifications, and Duncan's multiple range test was used to separate the means. Scores were stratified to include those specifically related to computer hardware, software, programming, agricultural computer use, miscellaneous technical questions, and computer experience with six specific software packages. Scores were also analyzed for differences due to the students' majors. Results indicated that, regardless of high school experience, freshman literacy scores were below those of seniors. It is concluded that the responsibility for computer literacy should be placed on the university, and several ways in which departments can work toward this goal are suggested. Statistical analyses are included, 12 references are listed, and the survey instrument is appended. (MES)

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# MEASURING COMPUTER LITERACY IN COLLEGES OF AGRICULTURE: RESULTS, CONCLUSIONS AND IMPLICATIONS

P. A. Curtis, F. A. Gardner
K. K. Litzenberg

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# MEASURING COMPUTER LITERACY IN COLLEGES OF AGRICULTURE: RESULTS, CONCLUSIONS AND IMPLICATIONS

P. A. Curtis, F. A. Gardner
K. K. Litzenberg

Curtis is Assistant Professor, Department of Animal and Food Science, University of Wisconsin; Gardner is Professor of Poultry Science, Litzenberg is Associate Professor of Agricultural Economics, both at Texas A&M University.

## Measuring Computer Literacy in Colleges of Agriculture; Results, Conclusions and Implications


### Abstract

This research presents a computer literacy assessment instrument to evaluate the current levels of computer literacy of students enrolled in agricultural courses at a major land grant university. Differences in levels of computer literacy resulting due to the classification of students and their majors in the College of Agriculture were measured. Stratification of general computer literacy is presented for catagories of: computer hardware, computer software, computer programming, agriculture computer use, and technical computer skill. Finally, the experience level of agricultural students with six specific computer software packages is presented.

## Measuring Computer Literacy in Colleges of Agriculture: Results, Conclusions and Implications

Familiarity with the computer in today's agricultural business, education and research communities is becoming increasingly more important. It has been predicted that by the year 2000 there will be a 44 percent increase in the number of service sector jobs related to agriculture as compared to this component in 1978 (Todt, 1984). Computers are being used to keep inventory and financial records and are becoming a necessary tool for decision making and resource allocation in agriculture (Litzenberg, 1982). The agriculture community is also beginning to use modern computer technology for information exchange among researchers and to deliver research results to the Extension service and other technology transfer groups. Direct access to large information repositories through computer terminals in the home or workplace can make keeping up with agriculture technology less costly and more convenient (Roth, et al. 1984). Many current undergraduate students in Colleges of Agriculture have limited and highly varied degrees of experience in using computer technology. To function efficiently in tomorrow's world, it is necessary that these students be computer literate. This does not mean they must be knowledgeable in all areas of computer applications and programming but they must have some experience in using computers and some concept of how computers and the accompanying software can be efficiently utilized (Magarrell, 1983).

Computer literacy is a topic which is receiving much attention at

colleges and universities. Wiggins and Trede (1985) have reported the effects of various factors including mathematic grades, classification of students and majors and other characteristics on student achievement. With the computer revolution occurring around us, educators are anxious to see that their students are at least exposed to the appropriate material. But what is computer literacy, and what level of expertise is appropriate for the College of Agriculture graduates in the '80s?

Computer literacy is a term which has different meanings to different people. The Office of Technology Assessment (OTA, 1982) defines computer literacy as, "the knowledge of how to use computer programs and information banks and how to critically evaluate the results". McWilliams (1982) defines computer literacy as familiarity with computers. He further states that computer literacy doesn't require speaking a computer language, nor does it even require extensive knowledge of already-written programs. All it requires is a sense of ease around computers, and the knowledge that personal computers are powerful tools, not menacing characters out of science fiction. Schlobin's (1985) definition of computer literacy demands at least a passing familiarity with the strengths, weaknesses and applications of different kinds of processors, operating systems, peripherals, and software. He felt that programming was not a high priority of microcomputer literacy.

Sheppard (1984) described computer literacy as a spectrum of four levels of literacy based on the desired expertise of the participants. They are: (1) Computer Appreciation where students are able to make intelligent decisions regarding the role of computers in society; (2) Computer Use where students are able to use the computer in solving problems in their own discipline (experience with application packages not necessarily as programmers.); (3) Software Creativity where students are able to write their own software

(experience with one or more programming languages.); and (4) Computer Competency where students have a broad-based understanding of computer-related topics. (This includes both hardware issues such as the internal electronics and operations of the computer as well as software related topics such as languages, data and file structure, operating systems and communication protocols.)

Which of these levels of literacy is the correct one? The answer depends on the rationale for individual students in developing computer literacy. Current agricultural industry requirements for computer expertise differ greatly between disciplines and quite a lot for different students in a given discipline within the College of Agriculture. Since we are preparing students for a future career, we are caught up in predicting potential future needs for all students. Alternative mechanisms are needed for implementing computer literacy at the various levels. Sheppard (1984) offers these possibilities: (1) Offer computer-related curricula as a major field of study; (2) offer computer-related curricula as a minor field of study; (3) provide a survey course(s) from a computer curriculum; (4) provide a survey course(s) in computer literacy; (5) incorporate computer-related topics into existing course offerings; (6) other (make microcomputers available for student use on their own, non-credit courses, etc.)

An alternative suggested by Van Horn (1984) is that students be given a set of tools that may be discipline dependent, but not course specific. A different work bench would be expected for students in electrical engineering than for students in English. Van Horn stressed independent learning--providing the general tools related to the basic problems of the discipline and let the students select the tools to be utilized. When students leave the university they will have to understand how to use those general tools to

solve problems.

Although many schools are requiring students to take a programming course, Van Horn (1984) feels that some students will want to learn to program and should be encouraged. However, he feels putting everybody through a programming course is a waste of time and would have negative effects.

Schlobin (1985) suggested universities offer a degree in microcomputer scienoe. He described the ideal microcomputer scienoe laboratory as being very different from current ones. Rather than being stocked with identical or even similiar microcomputers, it would be diverse. To produce the needed professionals, numerous microprocessors, peripherals, and programs would have to be available. In additon, multi-user and networked configurations would be required. Theory and practicality must work hand in hand in the classroom and laboratory. The graduate must have the professional skills to understand existing software (and hardware) and also to evaluate new developments. This curriculum would also offer valuable courses for the non-major.

## A Computer Literacy Assessment Instrument

A computer literacy assessment instrument was developed to evaluate the current level of computer literacy of students enrolled in agricultural classes at Texas A&M University (Curtis, 1985). A faculty representative from each department in the College of Agriculture at Texas A&M University was selected and asked to recommend two classes--one lower level, freshman or sophomore class and one upper level, junior or senior class--that best represented students from their department. The computer literacy assessment tool was administered to students in each of these recommended classes. Nineteen departments in the College of Agriculture at Texas A&M University were represented.

The results were analyzed by analysis of variance technique (SAS, 1979) to determine if there was a significant difference in literacy scores between the students in the freshman, sophomore, junior, senior and graduate classifications. Duncan's multiple range test was used to separate the means. Literacy scores were also stratified to include scores specifically related to computer hardware, software, computer programming, agricultural computer use, miscellaneous technical questions and computer experience. These additional scores were then analyzed to see if there were any differences due to the student's academic classification.

A copy of the computer literacy assessment tool can be found in the Appendix.

## The Study

Since the nature of literacy for society is expanding to include computer literacy, familiarity with the computer for agriculture students is becoming increasingly important. Therefore, it is important that students graduating from Colleges of Agriculture be computer literate in order to function effectively. In this study, computer literacy is defined on three levels as follows: (1) having a general knowledge of hardware and software applications; (2) having a basic understanding of the logic of programming; and (3) having a general idea of how computers are used in agriculture. This definition is similar to the second level of computer literacy (computer use) described earlier by Sheppard (1984).

Students from nineteen departments (or major area of study) representing the College of Agriculture at Texas A&M were used to sample the population. Of the 895 students taking the computer literacy assessment test, 149 were not from the College of Agriculture (Table 1). These 149 students along with 40 graduate agriculture students were enrolled in the participating undergraduate agriculture courses. During the 1984-85 spring semester, Texas A&M University had a total enrollment of 33,851 and the College of Agriculture had 4568 students (Table 2) or 13.5 percent of Texas A&M University's total enrollment. The target population for this study was the undergraduate students in the College of Agriculture--a total of 3162 students. The sample population contained 706 agriculture undergraduate or 22.3 percent of the undergraduate enrollment from the College of Agriculture.

Table 1. Number of students from majors in the College of Agriculture participating in computer literacy test (Texas A&M University, Spring 1985).

| MAJOR | NUMBER OF STUDENTS SURVEYED (U)* | (G)* | STUDENT ENROLLMENT IN MAJOR (U) | (G) | ENROLLMENT BY MAJOR (% SURVEYED) (U) | (G) |
|---|---|---|---|---|---|---|
| Agricultural Economics | 173 | 6 | 783 | 143 | 22 | 4 |
| Agricultural Education | 62 | 0 | 149 | 63 | 42 | 0 |
| Agricultural Engineering | 30 | 1 | 125 | 69 | 24 | 1 |
| Agricultural Journalism | 17 | 0 | 39 | 0 | 44 | 0 |
| Agronomy | 32 | 2 | 119 | 50 | 27 | 4 |
| Animal Science | 144 | 12 | 718 | 108 | 20 | 11 |
| Biochemistry | 19 | 0 | 320 | 70 | 6 | 0 |
| Dairy Science | 6 | 0 | 22 | 8 | 27 | 0 |
| Entomology | 9 | 2 | 22 | 89 | 41 | 2 |
| Floriculture | 15 | 1 | 42 | 3 | 36 | 33 |
| Food Science and Technology | 18 | 4 | 67 | 68 | 27 | 6 |
| Forestry | 7 | 1 | 47 | 33 | 15 | 3 |
| Horticulture | 41 | 1 | 105 | 59 | 39 | 2 |
| Mechanized Agriculture | 29 | 1 | 95 | 5 | 31 | 20 |
| Plant and Soil Sciences | 4 | 2 | 11 | 114 | 36 | 2 |
| Poultry Science | 5 | 0 | 18 | 19 | 28 | 0 |
| Range Science | 23 | 0 | 66 | 71 | 35 | 0 |
| Recreation and Parks | 5 | 0 | 135 | 0 | 4 | 0 |
| Wildlife and Fisheries | 48 | 3 | 208 | 126 | 23 | 2 |
| Undecided | 19 | 1 | | | | |
| AGRICULTURE TOTAL | 706 | 40 | 3162 | 1406 | 24 | 3 |
| OTHER (Non-Agriculture Majors) | 139 | 10 | | | | |
| TOTAL | 845 | 50 | | | | |

*U = Undergraduate Students
*G = Graduate Students

Table 2. Sample student population by academic classification enrolled in the College of Agriculture at Texas A&M University.

| CLASS | NUMBERS OF STUDENTS IN SURVEY• | PERCENT OF TOTAL SURVEYED | NUMBER OF STUDENTS IN COLLEGE OF AG |
|---|---|---|---|
| Freshmen | 199 | 22 | 423 |
| Sophomores | 193 | 22 | 608 |
| Juniors | 214 | 24 | 954 |
| Seniors | 239 | 27 | 1177 |
| Graduates | 50 | 5 | 1406 |
| TOTAL | 895 | 100 | 4568 |

•Includes all students (agriculture and non-agriculture)

## Classification

Each undergraduate academic classification was almost equally represented in the survey (Table 2). Although, the target population of this study were the undergraduate students, responses obtained from the graduate students added considerably to the study. The small sample--which may or may not be representative of the graduate population--did provide some interesting responses. These results will be presented, but the main discusssion will be centered on the undergraduate results.

The computer literacy test covered topics on hardware, software, computer programming, computer uses in agriculture, miscellaneous technical material and previous computer experience. With the exception of computer uses in agriculture, the topics were chosen because they cover the basic areas necessary for computer utilization and are the broad categories most often covered in other computer literacy tests. However, the computer literacy test developed for this study is more objective than most computer literacy tests as it centers on knowledge and experience rather than attitude. The section on computer uses in agriculture was added because this study was designed to evaluate computer literacy of students in the College of Agriculture.

## Results

Since the computer literacy test used in the study was an objective tool, scores were based on the percentage of correct responses. When mean test scores were analyzed no significant difference was found between freshmen,

sophomore and junior students. However, the mean score for seniors was significantly higher than underclassmen. The mean score from the small sample of graduate students was found to be significantly higher than all undergraduate scores. Although not statistically different, the mean scores for freshmen, sophomores, and juniors tended to increase with advanced academic classification (Table 3).

Many more freshmen (31%) and sophomores (17%) actually took computer courses during high school than juniors (9%) or seniors (7%) (Table 4). Eighty-seven percent of the seniors surveyed never used computers in high school compared to 45 percent of freshmen. This would indicate that students now entering the university have had more exposure to computers than students in the past. As would be expected, fewer computer courses have been taken by freshmen and sophomores since coming to Texas A&M University than by juniors and seniors (Table 5).

Only 31 percent of the seniors have never taken a computer course at Texas A&M as compared with 67 percent of freshmen. Based on these findings, it appears that although freshmen and sophomores have been exposed to computer use and have taken computer classes prior to their enrollment at Texas A&M, college level computer use and courses are still necessary to bring their computer literacy up to a level equal to that of the seniors. Difference in material covered in the college classes, the repeated computer exposure in other classes, and the relativeness of the computer to the student's major area of study are major contributing factors to the significant difference in undergraduates (Table 3). Therefore, to improve computer literacy college training in computer utilization is needed. A variety of computer literacy training alternatives (such as described by Sheppard, 1984 and Schlobin, 1985) should be made available to students at the university to allow them to bring

Table 3. Mean scores for literacy test by academic classification

| CLASSIFICATION | MEAN SCORES |
|---|---|
| Freshmen | 55[a] |
| Sophomore | 57[a] |
| Junior | 59[a] |
| Senior | 65[b] |
| Graduate | 69[c] |

a,b,c
Score means followed by different letters differ significantly ($P < 0.05$).

Table 4. Number of high school computer classes by academic classification.

| STUDENT CLASSIFICATION | N | NUMBER OF COURSES TAKEN: NONE (NUM) | NONE (%) | 1 COURSE (NUM) | 1 COURSE (%) | 2 COURSE (NUM) | 2 COURSE (%) |
|---|---|---|---|---|---|---|---|
| Freshmen | 199 | 124 | 62 | 62 | 31 | 12 | 6 |
| Sophomores | 193 | 151 | 78 | 32 | 17 | 9 | 5 |
| Juniors | 214 | 190 | 89 | 20 | 9 | 2 | 1 |
| Seniors | 239 | 219 | 92 | 16 | 7 | 4 | 2 |
| Graduates | 50 | 46 | 92 | 3 | 6 | 1 | 2 |

N = Total number students surveyed by classification
NUM = Number of responses
% = Percent of students from academic classification.

Table 5. Number of computer classes taken at Texas A&M University by academic classification.

| CLASS | N | NUMBER OF COURSES TAKEN: 0 NUM* | 0 %* | 1 NUM* | 1 %* | 2 NUM* | 2 %* | >2 NUM* | >2 %* |
|---|---|---|---|---|---|---|---|---|---|
| Freshmen | 199 | 134 | 67 | 61 | 31 | 2 | 1 | 1 | 1 |
| Sophomores | 193 | 116 | 60 | 63 | 33 | 11 | 6 | 2 | 1 |
| Juniors | 214 | 99 | 46 | 94 | 44 | 19 | 9 | 1 | 1 |
| Seniors | 239 | 74 | 31 | 111 | 46 | 37 | 15 | 16 | 7 |
| Graduates | 50 | 17 | 34 | 25 | 50 | 7 | 14 | 1 | 2 |

N = Total number students surveyed by classification
* NUM = Number of responses
% = Percent of students from academic classification

their individual computer literacy up to the level which will be needed in their specific discipline.

It would be interesting to repeat this study in five years to determine whether computer literacy scores for seniors who had obtained computer experience and classes in high school actually achieved a higher level of computer literacy than the senior students in this study. With the increased interest in using computers in secondary and even elementary schools, student exposure to computers should increase greatly. Depending on the content taught to students in elementary and secondary schools, literacy scores (as determined in this study) should increase considerably. However, computer use in specific agricultural disciplines would still need to be taught at the university. Rapid improvements in computer technology will in all likelihood continue. Once the elementary and secondary schools acquire hardware, this hardware will be used for many years with only limited up-dating. Universities will have to be responsible for training students to use a variety of up-to-date technological equipment. The concept of computer literacy will continue to change due to the increase in technology. Therefore, freshmen in 1990 would most likely have a higher level of computer literacy than 1985 freshmen. However, seniors in 1990 will most likely have a higher level of computer literacy than 1990 entering freshmen.

In an attempt to determine why the seniors' score was higher, the overall literacy scores were expanded into five categories--hardware, software, programming, uses of computers in agriculture and miscellaneous technical questions. Computer experience was also analyzed by determining the variety of computer activities and/or software applications to which the student had been exposed. It appears that as students progressed academically their knowledge increased in all aspects of computer literacy (Table 6). There were

Table 6. Literacy scores by academic classification.

| CLASS | SCORE | TOPIC SCORES | | | | | |
|---|---|---|---|---|---|---|---|
| | | SOFTWARE | HARDWARE | PROGRAMMING | AG USES | MISC. | EXPERIENCE |
| Freshmen | 55[a] | 55[a] | 61[a] | 37[ab] | 38[ab] | 73[a] | 33[a] |
| Sophs. | 56[a] | 57[a] | 62[a] | 40[ab] | 41[ab] | 71[a] | 30[b] |
| Juniors | 59[b] | 60[b] | 65[b] | 39[bc] | 43[b] | 74[a] | 37[c] |
| Seniors | 64[c] | 69[b] | 72[b] | 45[c] | 46[c] | 76[a] | 50[c] |
| Grads | 68 | 72 | 76 | 50 | 54 | 79 | 51 |

• Scores reflect the percentage of correct responses.

a,b,c Scores means in each column followed by different superscripts differ significantly (P<0.05).

no significant differences between freshmen, sophomore or junior overall scores, hardware section scores, or software section scores. Results from programming scores (Table 6) suggest that the students develop programming techniques and/or experience as they progress through college and that programming is not taught and rarely experienced at the high school level. The knowledge regarding computer use in agriculture, ag uses, (Table 6) tend to increase (reflected by a higher computer literacy test score) as the student progresses through school. This is most likely due to the number and variety of classes the student has taken in agriculture and his ability to determine possible computer application and/or computer applications being discussed and/or utilized in the agriculture classes.

## Computer Experience by Classification

A survey section of the computer literacy test asked students questions about their experience with a variety of software applications. The applications--feed formulation, accounting, data entry, word processing, spreadsheets and data base management--were chosen because they represented the most popular type of software applications available. Freshmen (63%), sophomores (58%), juniors (68%) as well as seniors (82%) reported data entry was the most common computer experience (Table 7). This is most likely due to the high number of laboratory courses in agriculture that require some type of data analysis. Word processing was the second most common area of experience --freshmen (46%), sophomores (35%), juniors (42%) and seniors (57%).

Freshmen reported having experienced 33 percent of the computer applications listed on the survey part of the computer literacy test. They

Table 7. Computer experience by academic classification.*

| CLASSIFICATION | FEED FORM. | ACCT. | DATA ENTRY | WORD PROCESS | SPREAD SHEET | BASE MGMT. |
|---|---|---|---|---|---|---|
| Freshmen (199) | 38 (19%) | 39 (20%) | 126 (63%) | 91 (46%) | 39 (20%) | 30 (15%) |
| Sophomores (193) | 24 (12%) | 37 (19%) | 112 (58%) | 65 (35%) | 28 (14%) | 28 (14%) |
| Juniors (214) | 60 (28%) | 57 (27%) | 142 (66%) | 90 (42%) | 51 (24%) | 41 (19%) |
| Seniors (239) | 97 (41%) | 92 (39%) | 197 (82%) | 137 (57%) | 101 (42%) | 74 (31%) |
| Graduates (50) | 14 (28%) | 7 (14%) | 42 (84%) | 36 (72%) | 19 (38%) | 17 (34%) |

* The percentages in the table reflect the percent of students from that specific classification who reported that form of computer experience.

did not differ significantly from juniors (37%) or sophomores (30%) (Table 6). However, seniors reported experiencing 50 percent of the applications listed on the survey section and the graduates reported 51 percent which was significnatly higher than freshmen, sophomores and juniors. These results suggest that students have been exposed to a variety of software applications through computer courses taken and/or computer uses in other college classes.

As students increase their experience with computer software, they are most likely increasing their knowledge of hardware because of the variety of machines utilized. According to Schlobin (1985) this in itself should increase computer literacy. As students use different machines they are also learning to use different kinds of software and operating systems. They also see strengths and weaknesses of the various computers. This is important because the student's computer literacy will not be based on a single brand of computer. It will also make it easier for the student to adapt to machines that he had not used before.

Because students in different departments within the College of Agriculture have different computer needs, individual departments may be in a better position to determine computer literacy standards for their department based on potential computer uses in their specific discipline. This would provide a minimum acceptable level of computer literacy for students graduating from a specific department or with a specific major. By basing the level of literacy on discipline needs, students will be better prepared for future career opportunities. It is also very important that standards are continually updated and revised. Some departments may want to emphasize one sub-area (hardware, software, computer utilization in agriculture, programming, etc.) more than would another department. For example, a department such as agricultural journalism may want to emphasize software

applications and de-emphasize programming.

In order for each department to reach the computer literacy standards they have determined, some method of literacy assessment for incoming students would be needed. Training would then be needed to bring the student up to the predetermined standards by the time of graduation. This could be accomplished through coursework (inside or outside the department) or computer use in (noncomputer) departmental courses.

Another alternative would be for the College of Agriculture to set basic computer literacy standards. This would provide a more uniform literacy level and initial assessment could be made at the time of admission and pretesting for other courses. Then departments would be responsible only for the additional training, if any, necessary for their field of study.

The results of this research have shown that regardless of high school experience freshmen literacy scores were still below those of seniors. Therefore, the responsiblity for computer literacy should be placed on the university and specifically on the College of Agriculture.

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APPENDIX

Course No. _____
Student ID _____
(Major) Dept. _____
(use code given on last page)

AG COMPUTER LITERACY ASSESSMENT INSTRUMENT (ACLAI)

The purpose of this survey is to attempt to determine the extent of computer skills of students in the College of Agriculture. Please answer all questions, but do NOT guess. PLEASE DO NOT WRITE ON THIS TEST FORM---WRITE ONLY ON THE SCANTRON.

1. In order to use a computer, a person must know how to program.
   a) true
   b) false
   c) I don't know

2. An electronic worksheet (i.e. VISICALC or SUPERCALC) has many rows and columns. The CRT screen is used as a window toobserve and manipulate entries in a selected set of rows and columns on the worksheet.
   a) true
   b) false
   c) I don't know

3. An operating system is an integrated system of programs which supervises the CPU operation and controls input/output and storage functions.
   a) true
   b) false
   c) I don't know

4. Compilers accept a batch, or number of lines, or language statements and develop an executable set of machine instructions.
   a) true
   b) false
   c) I don't know

5. A general purpose data base management system can be used for a farm or ranch production record system.
   a) true
   b) false
   c) I don't know

6. Which of the following software would be best to use if you wanted to send twenty letters, exactly the same, except for the addressee?
   a) Data Base Management
   b) Word Processing
   c) Accounting
   d) Electronic Spreadsheet
   e) I don't know

7. The computer is important in the decision making process of farmers and ranchers because the computer can:
   a) store and recall large amounts of data quickly
   b) perform calculations that a calculator cannot
   c) a and b
   d) I don't know

8. A computer network can be defined as:
   a) a number of computers "tied together" with data lines that communicate with each other
   b) a number of computers linked together to share resources such as disk storage or printers
   c) a central computer with a number of terminals hooked to it
   d) all of the above
   e) I don't know

9. Floppy disks are:
   a) storage mediums for microcomputers
   b) usually divided into tracks and sectors
   c) often capable of holding hundreds of thousands of characters of information
   d) all of the above
   e) I don't know

10. Computer software is a term describing:
   a) computer programs
   b) electronic components covered with soft plastic
   c) people who work with computers
   d) electronic parts of a computer system
   e) I don't know

QUESTIONS 11 AND 12 USE THE FOLLOWING LINES OF BASIC .....

```
100 LET A = 2
110 LET B = 4
120 LET C = 6
130 LET D = C/A +B
140 IF D< = 10 THEN 170
150 PRINT 'LAST LINE D = ', D
160 GOTO 200
170 PRINT D, C, B, A
180 LET C = C + 2
190 GOTO 130
200 END
```

11. How many lines of output would this segment of BASIC program print?
    a) 4
    b) 5
    c) 6
    d) 8
    e) I don't know

12. The fourth line of the output would look like ...
    a) 7 6 4 2
    b) 10 12 2 4
    c) Last line D = 11
    d) 10 12 4 2
    e) I don't know

13. The following type of memory can be used for computerized functions of arithmetic, program instructions supplied by the user, data storage, and retrieval
    a) RAM
    b) ROM
    c) PROM
    d) EPROM
    e) I don't know

14. Microcomputers can use the following language(s):
    a) FORTRAN
    b) BASIC
    c) PASCAL
    d) all of the above
    e) I don't know

15. In your opinion, which one of the following potential uses of the computer do you think is most important for ALLIED AGRICULTURAL INDUSTRIES (i.e. farm equipment suppliers, wholesale florists, etc.)?
    a) calculations for problem solving and decision aids
    b) order processing/inventory control
    c) accounting
    d) securing and analyzing commodity data
    e) I don't know

16. In your opinion, which one of the following potential uses of the computer do you think is most important for AGRICULTURAL PRODUCERS?
    a) calculations for problem solving and decision aids
    b) order processing/inventory control
    c) accounting
    d) securing and analyzing commodity data
    e) I don't know

17. In your opinion, which one of the following potential uses of the computer do you think is most important for AGRICULTURAL PROCESSORS?
    a) calculations for problem solving and decision aids
    b) order processing/inventory control
    c) accounting
    d) securing and analyzing commodity data
    e) I don't know

QUESTION 18 USES THE FOLLOWING LINES OF BASIC .....

```
100 LET A = 3
110 LET B = 4
120 LET C = A + B + 4
130 PRINT C
140 END
```

18. The correct output for the segment of BASIC programming shown above is:
    a) 9
    b) 7
    c) 11
    d) 13
    e) I don't know

19. A computer program is a:
    a) course on computers
    b) a piece of computer hardware
    c) a set of instructions to control the computer
    d) I don't know

20. The physical parts of a computer are referred to as:
    a) software
    b) hardware
    c) programs
    d) I don't know

21. The computer must have two types of information to solve a problem:
    a) your user number and program name
    b) the problem and the solution
    c) the data and instructions
    d) I don't know

**GENERAL INFORMATION**

22. My current TAMU classification is:
    a) freshman
    b) sophomore
    c) junior
    d) senior
    e) graduate student

23. How many semesters have you been at TAMU?
    a) This is my first semester.
    b) 1 to 3 semesters
    c) more than 3 semesters

Personal data:

24. Sex: (optional)
    a) male
    b) female

25. Age range: (optional)
    a) 17 - 19
    b) 20 - 22
    c) 23 - 25
    d) 26 - 29
    e) over 30

26. Ethnic background: (optional)
    a) Black
    b) Hispanic
    c) White
    d) Other

27. My current overall GPR is:
    a) less than 2.25
    b) 2.25 - 2.5
    c) 2.6 - 2.9
    d) 3.0 - 3.5
    e) above 3.5

28. I would describe the size of the high school I graduated from as:
    a) 1A (less than 135 students)
    b) 2A (135-274 students)
    c) 3A (275-649 students)
    d) 4A (650-1304 students)
    e) 5A (more than 1304 students)

29. During high school I:
    a) never used a computer.
    b) used computers in some of my classes.
    c) took a computer course(s).
    d) learned about computers through practical experience.
    e) attended commercial computer short courses (i.e. Radio Shack, Computerland etc.).

30. I learned about using computers by:
    a) never used a computer.
    b) used computers in some of my classes.
    c) took a computer course(s) at Texas A&M or other university.
    d) learned about computers through practical experience on my own.
    e) attended commercial computer short courses (i.e. Radio Shack, Computerland, etc.).

31. I would describe my knowledge of computers as:
    a) never used a computer
    b) novice
    c) advanced
    d) expert

32. I took _____ computer classes in high school.
    a) 0
    b) 1
    c) 2
    c) 3
    e) more than 3

33. I have taken _____ computer classes at Texas A&M.
    a) 0
    b) 1
    c) 2
    d) more than 2

34. Are you currently enrolled in a computer class?
    a) yes
    b) no

35. I have taken _____ computers classes other than in high school or at TAMU.
    a) 0
    b) 1
    c) 2
    d) 3
    e) more than 3

36. Do you own a computer?
    a) no
    b) yes

37. I enjoy working with computers
    a) agree
    b) disagree
    c) undecided

38. My programming experience is:
    a) never written a program
    b) written a program under 25 lines
    c) written a program over 25
    d) written a program over 100 and using arrays
    e) written a program over 100 lines with sequential file handling

39-45. I have used a computer to do:
    39. Least cost feed formulations
        a) yes
        b) no
    40. Accounting
        a) yes
        b) no
    41. Data entry for class projects, simulations or games
        a) yes
        b) no

42. Word processing
    a) yes
    b) no
43. Spreadsheet activities
    a) yes
    b) no
44. Data base management
    a) yes
    b) no
45. Other
    a) yes
    b) no

NUMBER CODES FOR CLASSIFICATION OF MAJOR:

| | |
|---|---|
| A | Agricultural Economics |
| B | Agricultural Education |
| C | Agricultural Engineering |
| D | Agricultural Journalism |
| E | Agronomy |
| F | Animal Science |
| G | Biochemistry |
| H | Dairy Science |
| I | Entomology |
| J | Floriculture |
| K | Food Science and Technology |
| L | Forestry |
| M | Horticulture |
| N | Mechanized Agriculture |
| O | Plant and Soil Science |
| P | Poultry Science |
| Q | Range Science |
| R | Recreation and Parks |
| S | Wildlife and Fisheries Sciences |
| T | Undecided |
| U | Other |

Developed by: Drs. P.A. Curtis, F.A. Gardner, K.K. Litzenberg
Texas A & M University, 1985.

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